

Summary (cont'd):

- **Industry must work to define a common interface between networks**
- **Proposed RTP parameters and values:**
 - Capability Indicator, Release Cause Indicator, Location Routing Number, and Forward Call Indicator value have been proposed in standards**
- **RTP is designed for efficient routing**
- **Does not preclude other network providers from deploying other solutions**

Any questions can be directed to:

**Kevin Moisan
(510) 901-6306
kjmoisa@pacbell.com**

or

**Steve Sposato
(510) 823-5267
sasposa@pacbell.com**

Task Force Assumptions

1. Only total costs figures will be made public - proprietary information will not be shared.
2. Implementation date for Service Provider Number Portability will be 1/1/97
3. Implementation will take 5 years.
4. Percentage of the network that is SPNP capable as a function of implementation year:
year 1 - 40%, year 2 - 30%, year 3 - 20%, year 4 - 5%, and year 5 - 5%
5. Discount rate = 10%
6. 100% of switches are donor switches
7. If switch replacement costs are included in the total cost figure it must be so noted
8. Current SS7 deployment costs are not to be included unless required as a result of SPNP
9. Only 50% of the implementation costs of a required network capability (e.g., AIN or IN) for a given proposal are to be included if the capability is not scheduled to be added.
10. Total cost figures will not include SMS costs
11. Costs are to be determined on a service provider network-wide basis
12. Costs should be determined for individual network items (e.g., DMS 100 and 5ESS)
but only the total should be input to this matrix

Pacific Bell Assumptions

- Present capabilities for network elements were used
- Costs for network elements (e.g., STPs) were not distributed unless multiple elements were required
- Incumbent network must be sized to accommodate additional traffic generated by default routing
- CPC will migrate to LRN after 12 months*
- Traffic load assumed was 245,000,000 calls/day

Pacific Bell Assumptions

- No 911 costs for single number solutions assumed
- SSP-STP A-links engineered @ 0.4 Erlang
- STP-SCP A-links engineered @ 0.3 Erlang
- 10 Digit GTTs were performed at an SCP

Economic Assessment Exceptions

- The following line items in the Economic Assessment Matrix have not been completed and are not included in the bottom line figures presented:
 - Line 2 & 3 for all alternatives (Real time effects)
 - Line 5 - (Changes to make existing services work)
 -
 - Line 10 - (Additional interoffice facilities)
 - Lines 16, 17, & 18 (OSSs)

Results

- MCI - Carrier Portability Code:
 - Initial Cost (1997 dollars) = \$175,000,000
 - Recurring Cost (1997 dollars) = \$29,000,000
- ATT - Location Routing Number:
 - Initial Cost (1997 dollars) = \$148,000,000
 - Recurring Cost (1997 dollars) = \$26,000,000
- GTE - Non-geographic Number (10% ported traffic):
 - Initial Cost (1997 dollars) = \$102,000,000
 - Recurring Cost (1997 dollars) = \$29,000,000

Results

- GTE - Non-geographic Number (40% ported traffic):
 - Initial Cost (1997 dollars) = \$111,000,000
 - Recurring Cost (1997 dollars) = \$29,000,000
- Pacific Bell - RTP (10% & 40% ported traffic):
 - Initial Cost (1997 dollars) = \$41,000,000
 - Recurring Cost (1997 dollars) = \$17,000,000

*Local Number Portability**Presentation to the California LNP Task Force
July 11, 1995*

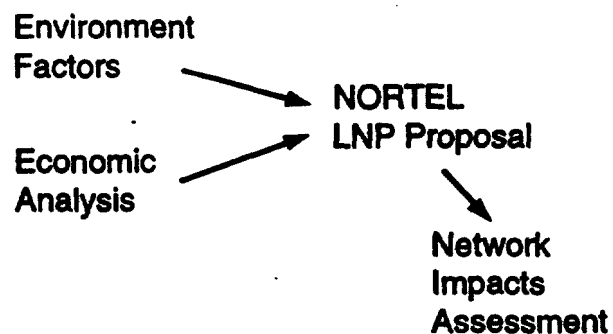
Sonu Mirchandani (404) 661-4133

Lou Pino (613) 765-3880

Ron Schwartz (613) 765-4593

95.07.11

1

Outline

95.07.11

2

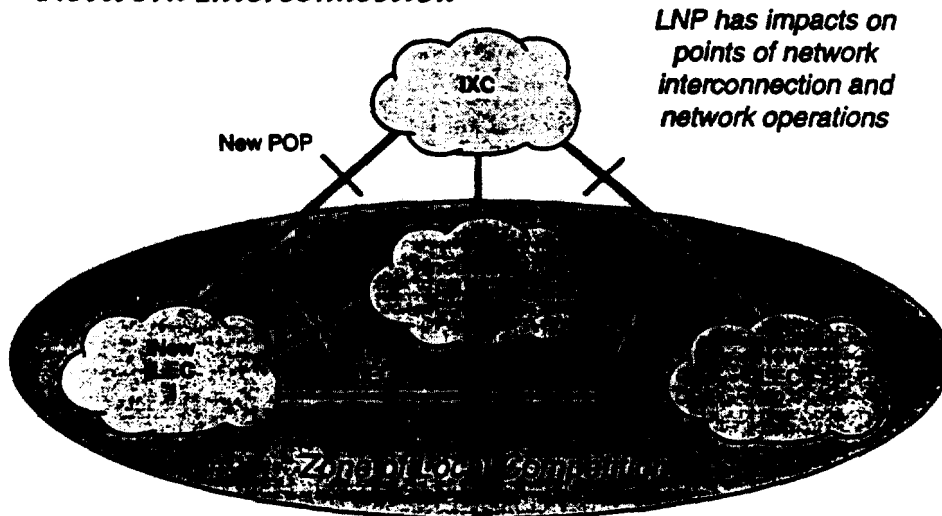
Environment Factors

- Network Interconnection
- Stakeholders
- LNP Solution Elements

95.07.11

3

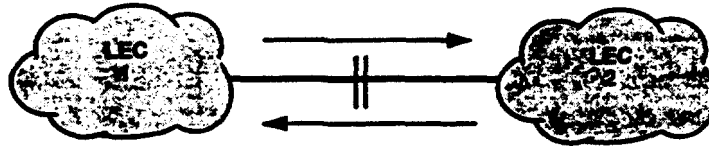
Network Interconnection



95.07.11

4

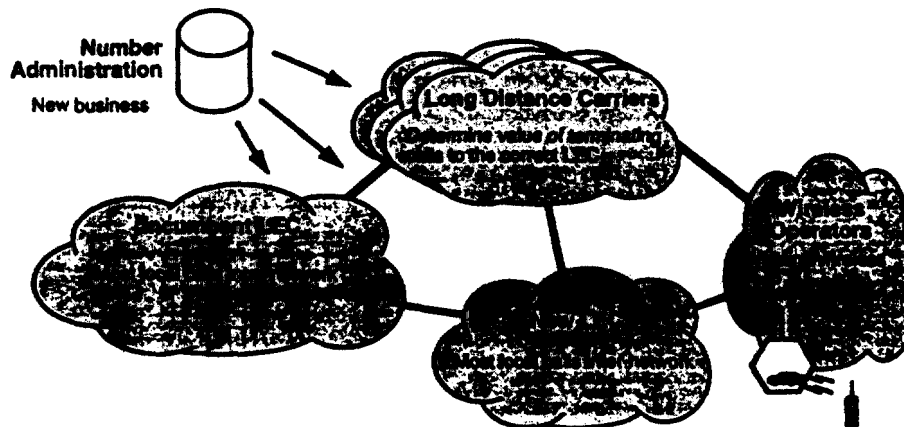
What's Important in LEC Interconnection?



- Signaling
 - encapsulation of data to enable call routing, billing and features (e.g. CLASS)
- Quality of Service
 - transmission quality
 - post-dial delay
- Reciprocity

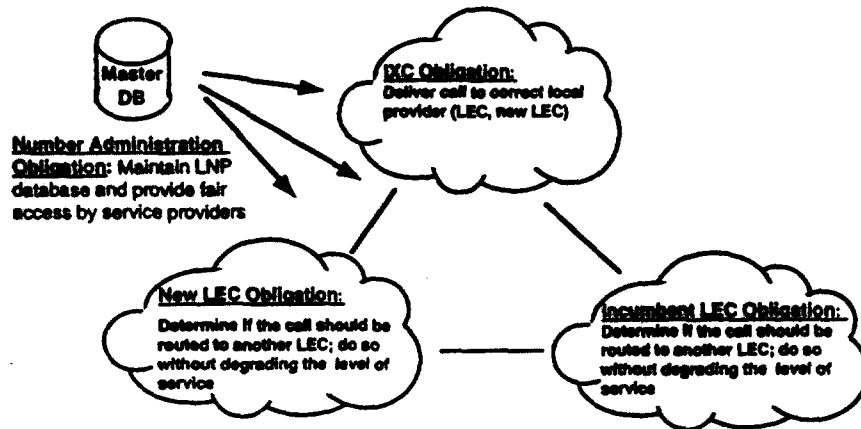
95.07.11

Stakeholder Drivers



95.07.11

Stakeholder Obligations

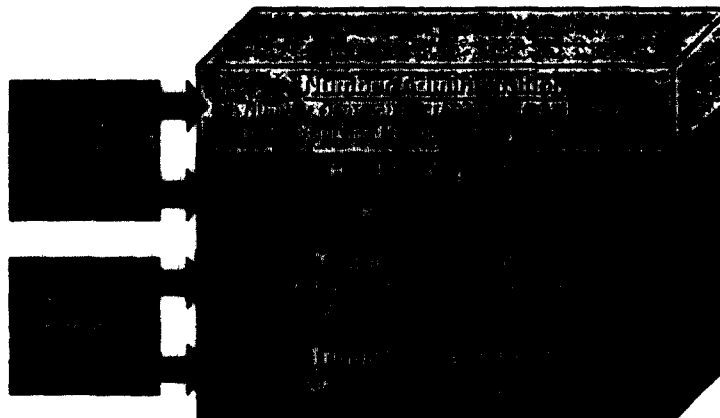


Vendors support Stakeholders

95.07.11

7

LNP Solution Elements



An understanding of the elements of all LNP solutions is key to determining where industry consensus is needed, and where service providers can make independent choices

95.07.11

8

LNP Economic Model

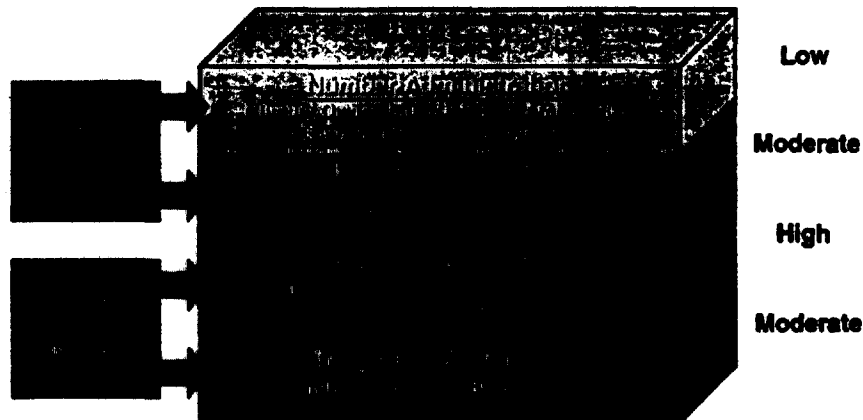
Key cost components to an LEC

- SSP capacity, to process LNP calls
- SCP capacity, for LNP data base queries
- SS7 capacity, for LNP data base queries and call setup impacts
- Trunking, for routing of calls destined to another network
- Network operations
 - Provisioning, for moves and changes
 - Billing
 - Traffic management
 - Maintenance

- Choice of LNP solution can impact each cost component differently
- Solution for optimized cost can differ for incumbent and new LECs

95.07.11

LNP Cost Sensitivities

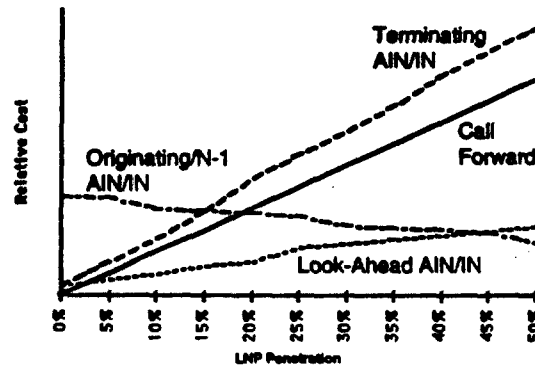


Best solution should optimize for highest cost components

95.07.11

10

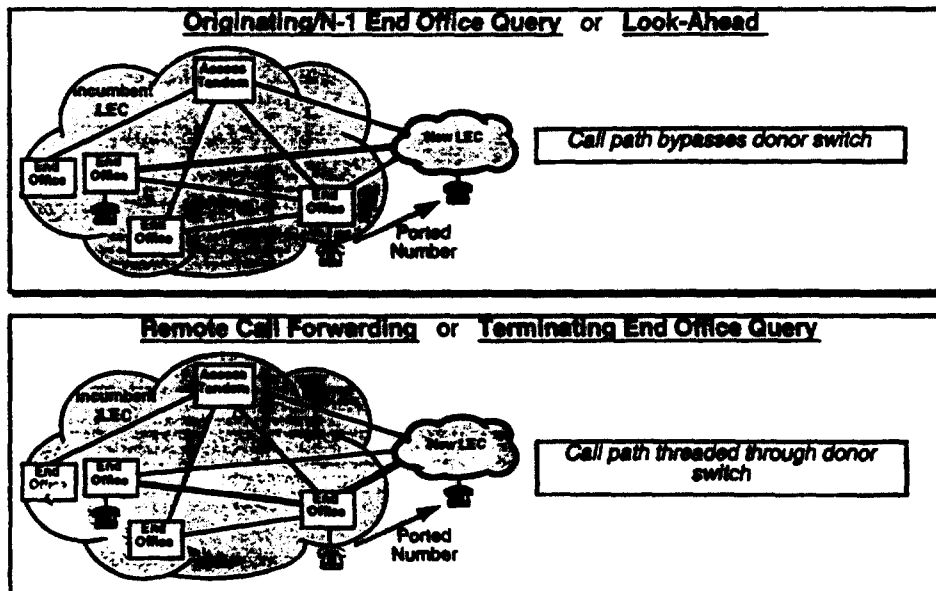
Relative Cost Model (Incumbent LEC)



Local Calls
(not via IXC)

95 07 11

Triggering Algorithm - Impact on Trunking Efficiency



Triggering Algorithm Assessment

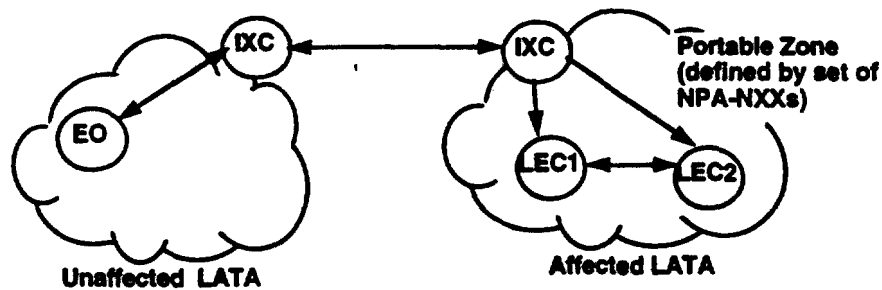
Trigger Type	How Often is DB Dipped?	Trunking Efficiency
• Originating/N-1 (AIN/IN)	All calls	Best
• Terminating (AIN/IN)	Ported calls only	Inefficient
• Look-Ahead (AIN/IN)	Ported calls only	Best
• Remote Call Forwarding	n/a	Inefficient

Look-Ahead triggering achieves signaling, trunking and capacity efficiencies

95.07.11

13

LNP N-1 Algorithm

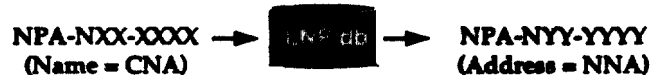


- IXC selects LEC1 or LEC2, based on called number, when terminating calls to portable zones
- Alternatively, IXC could always route to either LEC1 or LEC2 for ALL calls, and the selected LEC re-routes calls to other LECs as necessary

95.07.11

14

Name and Address (N&A) Routing



Two numbering domains for LNP

- **Name - NPA-NXX-XXXX - Customer Number Address (CNA)**
 - Customer's advertised number
 - Today: Name = Address
 - When customer moves to a different LEC, a new NNA is assigned in their address space
 - New, non-ported customers are assigned Name = Address
- **Address - NPA-NYY-YYYY - Network Node Address (NNA)**
 - Physical Address - Used by the network elements for routing
 - New LECs' switches are assigned new NXXs consistent with current number plan assignment practices

95.07.11

15

Numbering Plan for N & A

CNA = INPA-NXX-XXXX - Donor
 NNA = INPA-NYY-YYYY - Recipient

} Unique in North America

- Each ported number needs two DNs (short term)
- The NNA returned by the SCP cannot be an existing Customer Number Address (CNA)
- Each new LEC switch is assigned a unique INPA-NYY (same approach used to add a new switch or office code today)
- North American translations used for routing (LERG still applies)

95.07.11

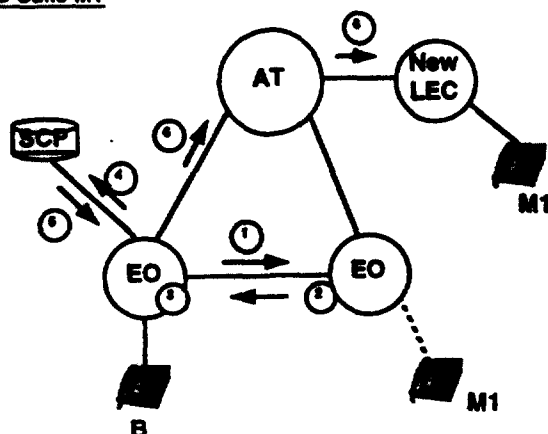
16

[illegible]

- 15.07.11

13

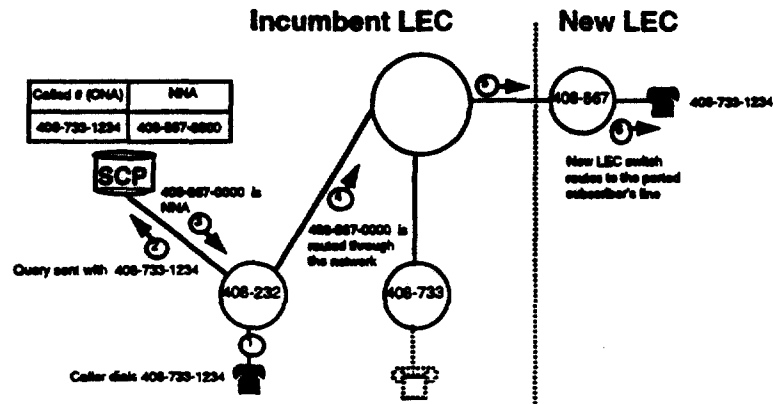
B Calls M1



- 05.07.11

38

Call Flow (N&A)



96.07.11

19

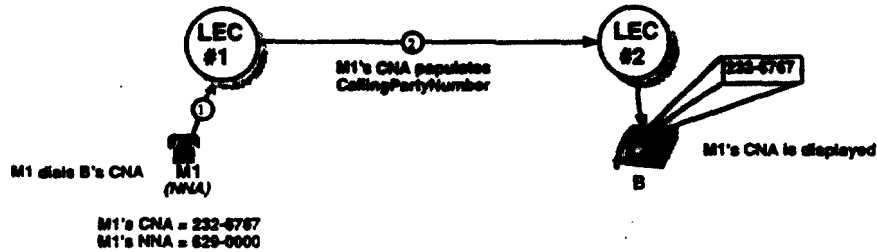
Calling Line ID

- For originations from a ported DN, the subscriber's published number (CNA) needs to be transmitted in the Calling Party Number field
- Numerous services including Calling Line ID, will work as expected in a portability environment because true calling DN is transmitted

96.07.11

20

Ported DN's Calling Line ID Displayed



95.07.11

21

Billing

- **Service Providers with LNP using N&A need four fields of addressing information to produce bills for end users**
 - **Originating Address (NNA) - Rating (V&H coordinates)**
 - **Destination Address (NNA) - Rating (V&H coordinates)**
 - **Originating Customer's Number (CNA) - Identifies Account Number**
 - **Dialed Number (CNA) - Call Detail on Customer's Bill**
- **SCP should direct SSP to record additional fields in AMA records**
 - **otherwise, downstream process needs to do LNP queries**
- **Service Providers need to evolve their downstream billing processes**

95.07.11

22

Proposed AMA Record Field Population

AMA Record Field	Normal Call	Ported Call
CallingPN	Calling #	Calling NNA
CalledPN	Called #	Called NNA
AMALine Number *	-	Calling CNA
AMADigits DialedWC *	-	Called CNA

* Parameters returned in AIN response message

95.07.11

23

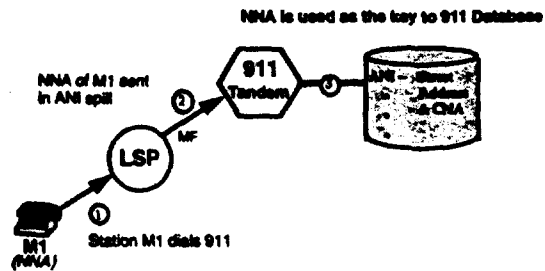
Automatic Call Back / Auto Recall (ACB/AR)

- STPs currently do 6 digit GTT for switch-to-switch based TCAP services (ACB/AR)
- N&A preserves 6 digit GTT by using the NPA-NXX of the NNA which uniquely identifies a switch
- Features which use GTTs need to be modified to populate SCCP fields with NNA rather than CNA

95.07.11

24

911



Solution to 911 for LNP N&A is similar to that needed for current deployment of RCFW

- NNA becomes a valid index to the 911 data base
- 911 Database needs a CNA field (to store and display) to allow the operator to verify the calling number with the caller

05.07.11

27

DN Resources

- Short term N&A solution consumes 2 DNs per ported number
- Solve this limitation in the long term by splitting the CNA domain from the NNA domain by evolving to the ELI numbering proposal for LNP

05.07.11

28

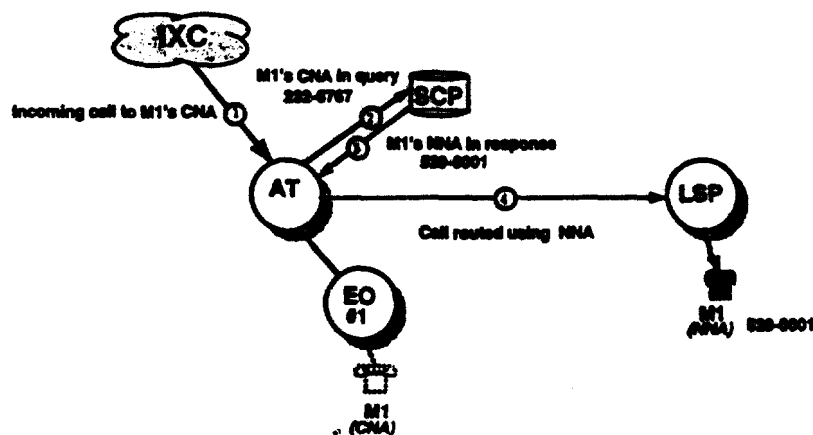
LNP Query Capability for IXC's

- IXC's have the option of doing LNP queries either:
 - in their own networks (N-1)
 - at a LEC Access Tandem
- AIN SIO triggers in the LEC Access Tandem can be assigned to trunks coming from IXC's that do not query for LNP

95.07.11

29

Incoming InterLATA Call Queried at LEC



95.07.11

30

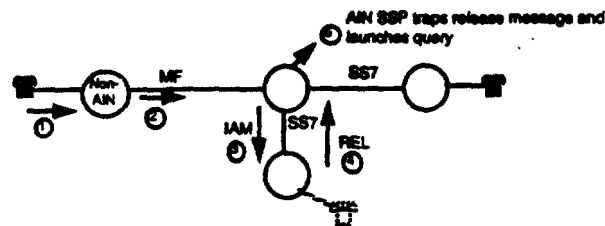
Calls Originated from Non-AIN Switches

Non-AIN Switches with ISUP

- LNP queries done by AIN capable switches by SIC trigger on trunks - all calls from these switches need to be queried

Non-AIN Switches with MF

- Look-Ahead on interworking indicator on release message will launch query at an AIN capable switch in the call path



95.07.11

31

Summary - NORTEL's LNP Proposal

Incumbent LEC	New LEC	

- Optimized solutions for each LEC's needs
- Common implementation where it is needed

95.07.11

32

Outline

- Overview
- Regulatory Climate
- Business Drivers
- LNP Architecture
- Network Impact
- LNP Models

Sonu Mirchandani
Senior Network Manager

Custom Network Solutions
